CONTENTS OF VOL. 78 Nos 1–6

NUMBER 1—JULY

Deformation of lamellar structure in TiAl–Ti_3Al two-phase alloys
By K. KISHIDA, H. INUI and M. YAMAGUCHI 1

Atomistic simulation of [001] symmetrical tilt grain boundaries in NiAl
By Y. MISHIN and D. FARKAS 29

TEM investigation of the microstructure and properties of Tl(Bi)-1223/Ag powder-in-tube superconducting tapes
By C. J. EASTELL, J. C. MOORE, S. FOX, J. EVERETT, A. D. CAPLIN, C. R. M. GROVENOR and M. J. GORINGE 57

The role of planar fault energy in the yield anomaly in $L1_2$ intermetallics
By A. T. PAXTON and Y. Q. SUN 85

***In-situ* observation of plastic deformation of Fe–Si bicrystals by white-beam synchrotron radiation topography**
By M. POLCAROVÁ, J. GEMPERLOVÁ, J. BRÁDLER, A. JACQUES, A. GEORGE and L. PRIESTER 105

Hydrogen absorption and storage in quasicrystalline and related Ti–Zr–Ni alloys
By A. M. VIANO, E. H. MAJZOUB, R. M. STROUD, M. J. KRAMER, S. T. MISTURE, P. C. GIBBONS and K. F. KELTON 131

A new monoclinic approximant of the decagonal quasicrystal in Al–Co–Cu–W and Al–Fe–Cr alloys
By X. Z. LIAO, H. X. SUI and K. H. KUO 143

Plan-view and cross-sectional TEM observations of interfacial reactions and fractal formation in a-Ge/Au films
By B. BIAN, T. TANAKA, T. OHKUBO and Y. HIROTSU 157

Influence of tungsten species on the structure of anodic titania
By H. HABAZAKI, K. TAKAHIRO, S. YAMAGUCHI, K. SHIMIZU, P. SKELDON, G. E. THOMPSON and G. C. WOOD 171

SiC Nicalon fibre–glass matrix composites: interphases and their mechanism of formation
By E. LE STRAT, M. LANCIN, N. FOURCHES-COULON and C. MARHIC 189

Factors influencing the flow and hardness of materials with ultrafine grain sizes
By M. FURUKAWA, Z. HORITA, M. NEMOTO, R. Z. VALIEV and T. G. LANGDON 203

Activation of slip in lamellae of α_2-Ti_3Al in TiAl alloys
By J. M. K. WIEZOREK, X.-D. ZHANG, W. A. T. CLARK and H. L. FRASER 217

Mechanical twinning in a 45°⟨$\bar{3}$21⟩ oriented polysynthetically twinned TiAl crystal at a high strain rate and a high temperature
By Z. JIN, G. T. GRAY III and M. YAMAGUCHI 239

NUMBER 2—AUGUST

Interfacial dislocations at the junction lines of {211} microfacets of a twin boundary in silicon
By PH. KOMNINOU and G. P. DIMITRAKOPULOS 255

Stacking faults in high-temperature-deformed Al–Pd–Mn icosahedral quasicrystals
By R. WANG, M. FEUERBACHER, W. YANG and K. URBAN 273

Formation of antiphase-boundary tubes and magnetization in Fe–35 at.% Al by plastic deformation at 77 K
By K. YAMASHITA, M. IMAI, M. MATSUNO and A. SATO 285

Reversible transformation between an icosahedral Al–Pd–Mn phase and a modulated structure of cubic symmetry
By M. DE BOISSIEU, M. BOUDARD, T. ISHIMASA, E. ELKAIM, J. P. LAURIAT, A. LETOUBLON, M. AUDIER, M. DUNEAU and A. DAVROSKI 305

Interaction between microstructure and multiple-step transformation in binary NiTi alloys using *in-situ* transmission electron microscopy observations
By L. BATAILLARD, J.-E. BIDAUX and R. GOTTHARDT 327

Phason defects in Al–Pd–Mn approximant phases: another example
By L. BERAHA, M. DUNEAU, H. KLEIN and M. AUDIER 345

Microstructural aspects of rolling deformation in ultrafine-grained copper
By O. V. MISHIN and G. GOTTSTEIN 373

Atomistic simulation of dislocation core configurations in TiAl
By J. PANOVA and D. FARKAS 389

Interfacial structure and growth mechanisms of lath-shaped precipitates in Ni–45 wt% Cr
By J. K. CHEN, G. CHEN and W. T. REYNOLDS JR 405

Weighted effective-medium approximations for elastic quasisymmetric completely random composites
By D. C. PHAM 423

Electron-energy-loss spectroscopy studies of Cu–α-Al_2O_3 interfaces grown by molecular beam epitaxy
By C. SCHEU, G. DEHM, M. RÜHLE and R. BRYDSON 439

High-resolution electron microscopy studies on coherent plate precipitates and nanocrystals formed by low-temperature heat treatments of amorphous Ti-rich Ti–Ni thin films
By T. KIKUCHI, K. OGAWA, S. KAJIWARA, T. MATSUNAGA, S. MIYAZAKI and Y. TOMOTA 467

Electron-beam-induced damage in amorphous SiO_2 and the direct fabrication of silicon nanostructures
By G. S. CHEN, C. B. BOOTHROYD and C. J. HUMPHREYS 491

A quantitative analysis of crack–interface interactions in alumina-based nanocomposites
By S. JIAO and M. L. JENKINS 507

NUMBER 3—SEPTEMBER

Preface
By H. KUNG and R. W. MARGEVICIUS 523

An appreciation of Dr T. E. Mitchell on his 60th birthday
By P. B. HIRSCH 525

Letter
By S. S. HECKER 527

Extrinsically dissociated dislocations in simulated aluminium
By J. P. HIRTH and R. G. HOAGLAND 529

Deformation and fracture behaviour of directionally solidified NiAl–Mo and NiAl–Mo(Re) eutectic composites
By A. MISRA, Z. L. WU, M. T. KUSH and R. GIBALA 533

Structural and defect analysis of V-alloyed C15 $NbCr_2$ from high resolution synchrotron X-ray powder diffraction
By F. CHU, Q. ZHU, D. J. THOMA and T. E. MITCHELL 551

Influence of crack propagation direction on {110} fracture toughness of gallium arsenide
By R. W. MARGEVICIUS and P. GUMBSCH 567

Role of irradiation spectrum in the microstructural evolution of magnesium aluminate spinel
By K. YASUDA, C. KINOSHITA, R. MORISAKI and H. ABE 583

Effects of the liquid phase on the high-temperature tensile ductility: from embrittlement to superplasticity
By J. KOIKE, K. MIKI, K. MARUYAMA and H. OIKAWA 599

Compositional softening in Mg–Al spinel
By W. T. DONLON, A. H. HEUER and T. E. MITCHELL 615

Effects of dislocation substructure on strength and toughness in polycrystalline NiAl processed via low-temperature hydrostatic extrusion
By J. J. LEWANDOWSKI, B. BERGER, J. D. RIGNEY and S. N. PATANKAR 643

Influence of OH^- ion point-defect complexes on the electron irradiation damage response of MgO crystals
By C. KINOSHITA, T. SONODA and A. MANABE 657

Mechanisms of energy dissipation during displacement-sensitive indentation in Ge single crystals at elevated temperatures
By B. YA. FARBER, V. I. ORLOV, V. I. NIKITENKO and A. H. HEUER 671

Local topology of silica networks
By L. W. HOBBS, C. E. JESURUM, V. PULIM and B. BERGER 679

Ion irradiation damage in geikielite ($MgTiO_3$)
By J. N. MITCHELL, N. YU, K. E. SICKAFUS, M. A. NASTASI and K. J. MCCLELLAN 713

On micropipes and nanopipes in SiC and GaN
By P. PIROUZ 727

An optical and transmission electron microscopy study of deformation-induced defects in 6H-SiC
By A. V. SAMANT, X. L. WEI and P. PIROUZ 737

Slip and twinning dislocations in sapphire (α-Al_2O_3)
By A. H. HEUER, K. P. D. LAGERLÖF and J. CASTAING 747

Observations of partial dislocations and basal twin boundaries in shock-wave-deformed sapphire
By S.-J. CHEN and D. G. HOWITT 765

Yield stress anomalies in single crystals of Ti–54.5 at.% Al
I. Overview and ⟨011] superdislocation slip
By S. JIAO, N. BIRD, P. B. HIRSCH and G. TAYLOR 777

NUMBER 4—OCTOBER

Early stages of the pyrolytic crystallization in amorphous nanopowders of silicon carbonitrides $Si_xC_yN_z$ by combined wide-angle X-ray and neutron diffractometries
By F. TÉNÉGAL, B. BOUCHET, R. BELLISSENT, N. HERLIN, M. CAUCHETIER and J. DIXMIER 803

Non-destructive analysis of crystallographic texture heterogeneity
By J. TARASIUK, K. WIERZBANOWSKI and A. BACZMAŃSKI 819

Grain-boundary character of titanium carbide produced by the reaction between titanium-containing molten alloy and silicon carbide
By C. IWAMOTO and S.-I. TANAKA 835

Interaction of interstitial solute atoms in bcc metals
By G. Haneczok 845

Interface instability in the bulk processing of 2223 BSCCO powders
By M. Dao, R. J. Asaro and R. J. Sebring 857

Surface relaxation of strained semiconductor heterostructures revealed by finite-element calculations and transmission electron microscopy
By D. Jacob, Y. Androussi, T. Benabbas, P. François and A. Lefebvre 879

Commensurately modulated stable states related to the γ phase in Mg–Al alloys
By P. Donnadieu, M. G. Harmelin, H. J. Seifert and F. Aldinger 893

Plasticity/interfacial energy influences on combustion-driven cracking of RDX energetic crystals
By W. L. Elban, R. W. Armstrong and T. P. Russell 907

Decomposition of the transformation displacement field
By W.-Z. Zhang 913

Dislocation structures of persistent slip bands in cyclically deformed polycrystalline copper
By T. Luoh, H. T. Tsai and C. P. Chang 935

Stacking-fault energy mismatch strengthening revisited
By E. Nembach, T. Pretorius and D. Rönnpagel 949

X-ray diffraction and Mössbauer characterization of attrition-milled nanostructured iron and iron–nitrogen powders
By J. Rawers, D. Cook and T. Kim 965

Study of Snoek-type relaxation in hydrogenated Inconel 600
By P. Aaltonen, Yu. Jagodzinski, A. Tarasenko, S. Smouk and H. Hänninen 979

NUMBER 5—NOVEMBER

Defect production, annealing kinetics and damage evolution in α-Fe: an atomic-scale computer simulation
By N. Soneda and T. Diaz de la Rubia 995

Solid-state reactions in mechanically alloyed Al–V powders
By F. Cardellin, V. Contini and G. Mazzone 1021

On the correlation of grain boundary misorientation distribution with critical current in bulk processed $YBa_2Cu_3O_{7-\delta}$
By J.-Y. Wang, A. H. King, Y. Zhu, Y.-L. Wang and M. Suenaga 1037

Atom cluster arrangements in cubic approximant phases of icosahedral quasicrystals
By K. Hiraga, K. Sugiyama and T. Ohsuna 1051

Facilitated synthesis of cubic boron nitride by a mechanochemical effect
By S. Horiuchi, J. Y. Huang, L L. He, J. F. Mao and T. Taniguchi 1065

Casimir effect around a screw dislocation
By I. Pontual and F. Moraes 1073

Test of the validity of the Darken/Manning relation for diffusion in ordered alloys taking the $L1_2$ structure
By I. V. Belova and G. E. Murch 1085

A general theory of curved deformable interfaces in solids at equilibrium
By M. E. Gurtin, J. Weissmüller and F. Larché 1093

Icosahedral quasicrystal formation in Ti–Zr-based alloys and a new classification technique
By W. J. Kim, P. C. Gibbons and K. F. Kelton 1111

Roles of porosity, residual stresses and grain size in the fracture of brittle solids
By G. Wang and V. D. Krstic 1125

The interaction of twins and precipitates in a Mg–7.7 at.% Al alloy
By M. A. Gharghouri, G. C. Weatherly and J. D. Embury 1137

Dynamic void collapse in crystals: computational modelling and experiments
By S. Nemat-Nasser, T. Okinaka, V. Nesterenko and M. Liu 1151

Investigation of structural defects and inhomogeneities in Al–Pd–Mn icosahedral quasicrystals by combined synchrotron X-ray topography and phase radiography
By L. Mancini, E. Reinier, P. Cloetens, J. Gastaldi, J. Härtwig, M. Schlenker and J. Baruchel 1175

NUMBER 6—DECEMBER

Analysis of dislocation microstructures: impact of force truncation and slip systems
By H. Y. Wang, R. LeSar and J. M. Rickman 1195

Symmetry and microstructure in martensites
By K. F. Hane and T. W. Shield 1215

The bcc-to-fcc phase transformation during dezincification of β-phase Cu–Zn
By H. E. Troiani, J. L. Pelegrina and M. Ahlers 1253

Plasticity in 18R Cu–Zn–Al single crystals: temperature and strain-rate dependence
By A. CUNIBERTI and R. ROMERO 1269

Mechanical properties of poly(ethylene terephthalate) at the near surface from depth-sensing experiments
By A. FLORES and F. J. BALTÁ CALLEJA 1283

Structural study of a group of magnetic multilayered oxides in the $BaO–TiO_2–Fe_2O_3$ system
I. High-resolution electron microscopy
By L. A. BENDERSKY, T. A. VANDERAH and R. S. ROTH 1299

Low-frequency internal friction of foamed Al
By C. S. LIU, Z. G. ZHU, F. S. HAN and J. BANHART 1329

A defective structure for Tl-deficient $Tl_{2-x}Ba_2CaCu_2O_y$ superconductors
By X. F. ZHANG 1339

A study of the thermodynamics of segregation and partial order at (111) antiphase boundaries in Ni_3Al
By M. SLUITER and Y. KAWAZOE 1353

Subject index 1365

Index of authors (with titles of papers) 1369